DEPARTMENT OF THE ARMY
U.S. Army Medical Department Center And School
And Fort Sam Houston
Fort Sam Houston, Texas 78234-5014

AMEDDC&S & FSH Memorandum
No. 385-33

Occupational Safety
Hazard Communication (HAZCOM) Program

1. History. This memorandum supersedes AMEDDC&S & FSH Memos, Regs, and other publications related to the Hazard Communication Program.

2. PURPOSE.

a. To provide the U.S. Army Medical Department Center and School (AMEDDC&S) and Fort Sam Houston (FSH) personnel with the guidance, regulatory requirements and safe work practices for storage, use, and disposal of hazardous chemicals.

b. To implement the Occupational Safety and Health Administration (OSHA) standard, 29 Code of Federal Regulations (CFR) 1910.1200, Hazard Communication at FSH.

c. To ensure that potential hazards associated with the storage, use and disposal of workplace chemicals be evaluated, and all such information be communicated to the employees by implementing a written HAZCOM program.

d. To ensure that the HAZCOM program includes: employee training; reading and interpretation of Material Safety Data Sheet (MSDS); the necessary warning labels or signs for the chemical containers; detailed information on the exposure potential and the hazardous nature of the workplace chemicals; Personal Protective Equipment (PPE); emergency response and first aid procedures for spills, leaks, or exposure to workplace chemicals; and, the necessary engineering controls required for maintaining a safe and healthful workplace.

e. To provide employees at FSH with information that will enable them to recognize the potential physical and health hazards associated with the use of hazardous chemicals so that the safe work procedures are implemented.

3. APPLICABILITY.

a. This memorandum is applicable to all military, civilian, and contractor personnel attached to or working at the AMEDDC&S and FSH, Camp Bullis, and Canyon Lake.

b. This memorandum is applicable to the manufacturing, use, storage, and disposal of hazardous chemicals. Laboratories that use chemicals are covered by the OSHA standard 29 CFR §1910.1450, Occupational Exposures to Hazardous Chemicals in Laboratories.

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4. REFERENCES. The following references are available for review at the Directorate of Safety Environment and Fire (DSEF), FSH, Texas.

a. Medical Command Regulation, 385-1, Hazard Communication

b. FSH Regulation 385-10, Occupational Safety and Health Program.

c. Department Of Defense (DOD) Instruction 6050.5, Hazardous Material Information System.

d. OSHA Standard 29 CFR §1910.1200, Hazard Communication.

e. OSHA Standard 29 CFR §1910.1450, Occupational Exposures to Hazardous Chemicals in Laboratories.

f. The following websites can be accessed for additional resources.

http://safety.army.mil/home.html
http://www.osha.gov
http://web.ansi.org

5. POLICY.

a. The FSH Commander has designated the Safety and Occupational Health Manager as the HAZCOM Program Administrator.

b. All Commanders/Directors/Office Chiefs will ensure that their employees are aware of the potential safety and health hazards associated with the generation and use of chemicals, how to protect themselves from potentially harmful exposures, and safe work practices that minimize or prevent the occurrence of potentially harmful situations.

c. Procedures for use, storage, and disposal of chemicals and hazardous materials will be in compliance with the requirements of 29 CFR 1910.1200 and this memorandum.

d. All chemicals having chemicals or hazardous substances shall be labeled at all times in accordance with 29 CFR 1910.1200 and this memorandum.

e. Portable transfer containers do not require warning labels if used by the same individual. All of the chemical in the transfer container would need to be used by the end of the work shift, and the transfer container shall never be left unattended.

6. GENERAL REQUIREMENTS.

a. A chemical inventory shall be maintained at worksite. The inventory, at a minimum, shall list the name and quantity of each of the chemicals generated, used or stored at the worksite.

b. An MSDS for each of the worksite chemicals shall be readily accessible and be made available to all the employees.

c. All personnel potentially handling worksite chemicals shall be initially trained on the HAZCOM standard and on how to read and interpret a Material Safety Data Sheet (MSDS). All the necessary information required for the safe handling, storage, and disposal of a chemical/product is listed on an MSDS. Please see Appendix A: "Material Safety Data Sheet, Explanation of Terms," for a detailed discussion.

Annual HAZCOM refresher training shall be accomplished by the activity. All training shall be accomplished prior to conducting non-routine tasks that involve the use of hazardous chemicals.

d. All personnel working with chemicals shall be trained on how to read and interpret a material safety data sheet (MSDS). Please see Appendix B, for an illustration.

7. RESPONSIBILITIES.

a. Commander, AMEDDC&S and FSH. The Commander has the overall responsibility to ensure that the HAZCOM Program is implemented at FSH. Commander delegated the responsibility of administering the HAZCOM program to the Occupational Safety & Health Manager, Installation Safety Office (ISO).

b. Occupational Safety & Health Manager, Installation Safety Office (ISO). The ISO is responsible for administering the HAZCOM Program. This includes developing and updating memorandums, providing assistance, and training, to all activities at FSH.

The ISO shall:

(1) Serve as the technical and regulatory advisor to the extent possible and appropriate for the FSH HAZCOM Program.

(2) Develop, periodically review, and update the policy and procedures for the safe handling and use of workplace chemicals.

(3) Assist commanders, directors, department chiefs and collateral duty safety officers in identifying and inventorying chemicals used in their area of responsibility.

(4) Assist in the identification and classification of all the workplace chemicals at FSH, as “hazardous” or “non-hazardous.”

(5) Provide technical oversight and project management support, as related to the Occupational Safety and Health aspects, to all the projects requiring the use or generation, and disposal of chemicals. Technical assistance shall include performing a review of the available documentation as necessary in keeping compliance with the applicable regulatory requirements.

(6) Provide training to all the FSH employees.

(7) Assist units and activities in identifying the appropriate and the necessary controls (training, exhaust ventilation, the PPE etc.) to be

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implemented for handling (storage, use, and disposal etc.) workplace chemicals.

(8) Conduct an annual audit of all the units to ensure that various HAZCOM program elements are implemented.

c. Preventive Medicine. Preventive Medicine shall provide professional occupational health support to the HAZCOM Program.

Preventive Medicine Services shall:

(1) Provide assistance to the ISO and various units in implementing the HAZCOM program.

(2) Provide training on the use, maintenance and the care of the PPE such as respirators etc.

(3) Verify, per AR 11-34, The Army Respiratory Protection Program, and the FSH Memo 385-5, Respiratory Protection Program, that personnel are fit tested and medically cleared to use the appropriate respirators.

(4) Assist in the training of personnel for the purposes of implementing the HAZCOM program.

(5) Assist supervisors or unit commanders in the selection of appropriate respiratory protection equipment and other PPE.

(6) Assist in the interpretation of an MSDS.

(7) Evaluate the workplace chemicals for the potential hazardous and IDLH conditions.

(8) Educate various units on the significance of controls (training, exhaust ventilation, the PPE etc.) that prevent or minimize the occupational exposures.

(9) Provide Occupational Health related updates to the ISO and to the units and activities as necessary.

d. Readiness Logistics Business Center (RLBC). The RLBC shall provide assistance and necessary logistical support to the ISO and various units located at FSH. Such support shall include the following:

(1) Ensuring that all the chemicals are identified and labeled upon receipt, during storage, and when issued/shipped.

(2) Providing assistance in obtaining MSDSs.

(3) Maintaining an inventory of the units and the respective chemicals that are procured through the RLBC.

e. Laboratory Supervisors and Managers. Laboratory director shall appoint a Chemical Hygiene Officer and ensure that effective chemical hygiene plans are developed.

f. Commanders, directors, and supervisors shall be responsible for implementing the HAZCOM program at their respective units and ensure that:

(1) Policies and procedures stated in this memorandum are implemented.

(2) The chemicals that are stored, used or generated, and to be disposed of by their respective organizations are identified and listed in the inventory.

(3) The inventory of chemicals are maintained and updated at a minimum of once a year and whenever a new chemical is introduced into the workplace.

(4) Work site specific Standard Operating Procedures (SOPs) for the storage, use, and disposal of chemicals are developed, maintained, and updated as necessary.

(5) Personnel are trained on worksite specific tasks or job duties.

(6) The worksite specific "refresher" training is repeated, at a minimum once a year, or whenever there is a change in the job duties or the worksite functions and when a new chemical is introduced into the workplace.

(7) All the training is documented on CSFS Form 98-E, Employee Safety and Health Training Record.

(8) The appropriate control measures are implemented. Engineering controls shall be installed and the PPE shall be made available.

(9) The ISO is consulted, as necessary, for implementing a HAZCOM program.

(10) A Collateral Duty Safety Officer (CDSO) is appointed to assist supervisors in carrying out the HAZCOM program.

g. A CDSO shall:

(1) Keep personnel informed of the various elements of the HAZCOM program.

(2) Ensure that personnel are trained (initial and refresher) on worksite specific functions or tasks.

(3) Document both the general and worksite specific training on CSFS Form 98-E.

(4) Prepare and maintain an inventory of all the worksite chemicals.

(5) Update the chemical inventory, at a minimum, once a year and whenever a new chemical is introduced into the workplace.

(6) Obtain MSDSs for all the chemicals used at the work place.

(7) Maintain MSDSs on-site at all times, for easy access, reference, and without any restrictions.

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(8) Provide a copy of all the MSDSs to the Directorate of Safety, Environment, and Fire (ISO and Envrionmental Office), PM, and to the RLBC.

(9) Ensure that all chemical containers are labeled at all times.

(10) Ensure that the necessary engineering controls are in place for the storage, use, and disposal of the worksite chemicals.

(11) Ensure that necessary PPE is issued to personnel.

(12) Enforce the use of PPE.

(13) Establish procedures for handling emergencies and spills or leaks.

(14) Ensure that vendors/contractors have MSDSs if they bring or use chemicals/products) at the worksite.

h. Employees: All employees will participate in the training, become familiar with the hazards associated with chemicals they use, employ proper safe work practices, use personal protective equipment, and warn others to take appropriate action to prevent improper use of and/or exposure to hazardous chemicals.

i. The Fire and Emergency Services Division (FESD) shall:

(1) Provide emergency response and rescue support, as requested and as necessary.

(2) Be familiar and/or acquainted with all the units that use or generate, store, and dispose off chemicals.

(3) Train and maintain proficiency in the related emergency procedures that pertain to the FSH HAZCOM program (showers, washing, evacuation, and ventilation etc.).

(4) Maintain emergency rescue equipment in excellent working condition and have it “ready” for use at all times.

(5) Assist in the training of personnel as appropriate.

(6) Assist the ISO in evaluating the effectiveness of the safety programs.

8. TRAINING. OSHA requires that the employees be trained initially, and whenever a new chemical/product is introduced into the worksite, on the use, storage and disposal of chemicals/products at worksite. The following discussion reiterates the training aspects that have already been noted above in different sections.

a. Employees shall be trained prior to their working around chemicals. This training shall be documented on CSFS Form 98-E, Employee Safety and Health Training Record. The “initial” training shall address the following aspects.

(1) An overview of the FSH HAZCOM Program.

(2) Reading and interpreting an MSDS.

(3) Potential physical hazards associated with the use, storage, and disposal of chemicals.

(4) Potential health hazards associated with the use, storage, and disposal of chemicals.

(5) Knowledge of the necessary controls (required PPE, and exhaust ventilation, etc.) for maintaining a safe and healthful worksite.

(6) Knowledge of emergency procedures (worksite evacuation, showering or washing for splashes, and containing a leak or spill etc.).

b. Employees shall be trained on worksite specific tasks. Worksite specific training shall address the following aspects.

(1) Knowledge of the worksite specific operating procedures.

(2) Worksite chemicals, job duties, and the potential hazards.

(3) Routine tasks or procedures to be performed and changes that are potentially hazardous to employees and the workplace.

(4) Knowledge of approved PELs.

(5) Use of personal protective and other safety equipment.

(6) Procedures to follow in case of an emergency.

c. Supervisors will be knowledgeable in worksite specific procedures. Supervisor’s training shall address the following aspects.

(1) Permissible exposure levels for the chemicals to be used and the necessary controls required for maintaining a safe and healthful workplace.

(2) Knowledge of acceptable and safe worksite procedures.

(3) Compliance requirements for the HAZCOM program to include reporting and record keeping.

(4) Effective oversight for maintaining a safe and healthful workplace (proper placement of fresh air circulation systems, and use of PPE etc.).

(5) Training for emergency procedures includes the use of life-saving equipment, evacuation plan, making contacts with emergency personnel, etc.

d. Additional training is required when:

(1) There is a change in the responsibilities of the personnel (job duties).

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(2) There is a change in the chemicals (additional chemicals or products introduced; new product replaced the earlier chemical) or a change in worksite procedures.

(3) an employee's job performance reflects that there are inadequacies in the employee's knowledge or use of chemicals.

9. OPERATING PROCEDURES.

Standard operating procedures shall, at a minimum, describe the following aspects.

a. Worksite chemicals, job duties of various personnel, and the potential hazards.

b. Acceptable and safe worksite procedures.

c. Permissible exposure levels for the chemicals to be used and the necessary controls required for maintaining a safe and healthful workplace.

d. Routine tasks or procedures to be performed and changes that are potentially hazardous to the employees and the workplace.

e. Use of personal protective and other safety equipment.

f. Procedures to follow for containing spills or leaks.

g. Procedures to follow for an occupational exposure (washing or taking a shower in case of splashes, and exiting to fresh air for inhalation etc.).

h. Procedures to follow for emergencies.

10. EMERGENCY PROCEDURES.

a. The worksite supervisor, upon recognizing that an emergency situation developed as a result of the use or generation, storage and disposal of chemicals or products, shall ensure that all the employees evacuate the worksite immediately.

b. The supervisor shall contact the following:

(1) FESD.

(2) ISO.

(3) Preventive Medicine Service.

(4) Security.

(5) The COR when applicable.

c. The supervisor shall investigate and identify work practices or events that resulted in an emergency situation.

d. The supervisor shall incorporate the results of his investigation into the training course or the risk management process to eliminate or minimize and to prevent the repetition of such emergency situation.

11. CONCLUDING WORKSHIFT OR OPERATIONS.

a. All PPE, tools of the trade, and chemicals or products shall be cleaned or decontaminated, necessary maintenance performed, and returned to their proper storage location.

b. All the personnel shall follow appropriate cleanup procedures prior to exiting the workplace. Such procedures shall include but not be limited to: taking a shower; cleaning or rinsing hands with warm water and soap; and, removing work clothes and changing into regular clothing etc.

c. The supervisor shall document and maintain a log of events that have taken place during the workshift. Supervisor shall observe and note unusual events, respond appropriately, and inform the appropriate personnel or organizations, such as FESD, ISO, and the COR etc. Examples of unusual events include but are not be limited to: excessive vapors or fumes; and, employees exhibited signs of discomfort etc.

12. Contractual Requirements.

The following paragraphs are applicable to the contractual requirements (projects) to be initiated by respective units or organizations.

a. The Project Manager (or a respective organization) shall be responsible for identifying and for listing all the applicable “chemicals or products” in their scope or statement of work, if the project work entails the use or generation of a “chemical or product”.

b. The Project Manager (or a respective organization) shall be responsible for identifying and for listing all the applicable, appropriate, and relevant regulations in their scope or statement of work, if the project entails the use or generation of a “chemical or product”.

c. The appropriate contracting office shall incorporate into all contracts (projects or requirements) that entail the use or generation, storage, and handling of chemicals, contractual clauses requiring the contractor(s) performing the work to be cognizant of the HAZCOM Program and be in compliance with the OSHA standards.

d. The contracting office shall take appropriate action should any noted deficiencies be brought to their attention to ensure a safe and healthful work place for the FSH employees.

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Appendix A

Material Safety Data Sheet

Explanation of Terms

a. Workplace and Workarea.

(1) Workplace. Any building, job site, or establishment having one or more work areas.

(2) Work area. A room or space within a workplace where chemicals are used and employees are present.

b. Government and Other Organizations.

(1) ACGIH. American Conference of Governmental Industrial Hygienists. An organization of professionals in governmental agencies or educational institutions engaged in occupational safety and health programs. ACGIH establishes recommended occupational exposure limits for chemical substances and physical agents.

(2) CAS. Chemical Abstracts Service. An organization under the American Chemical Society. CAS abstracts and indexes chemical literature from all over the world. CAS numbers are used to identify specific chemicals or mixtures.

(3) EPA. U.S. Environmental Protection Agency.

(4) EPA-number. The number assigned to chemicals regulated by the EPA.

(5) IARC. International Agency for Research on Cancer.

(6) NIOSH. National Institute for Occupational Safety and Health. A federal agency responsible for conducting research on health and safety concerns, testing and certifying respirators, and training occupational health and safety professionals.

c. Chemicals and Compounds.

(1) Chemical. Any single element or a chemical compound.

(2) Chemical Compound or product. Any substance consisting of two or more elements combined according to the laws of chemistry. Each compound or product of chemical combination has its own distinct properties.

(3) Hazardous chemical. Any chemical that presents a physical or a health hazard.

(4) Chemical manufacturer. A producer or distributor of chemicals.

(5) Common name. Any name used for the identification of a chemical, such as a code name, code number, trade name, brand name, or generic name.

(6) Trade name. The commercial name or trademark by which a chemical is known. One chemical may have a variety of trade names depending on the manufacturers or distributors involved.

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d. Chemical Exposure and Health Effects.

(1) Health hazard. A chemical or product having potential to cause acute or chronic health effects in exposed employees or population, is considered a health hazard.

The ingredients of a product that have the potential to adversely affect human health and environment are identified and listed by the manufacturer both on the package and on the Material Safety Data Sheet (MSDS).

(2) Toxic Material. A substance that is harmful, destructive, deadly, or poisonous to the human health and the environment.

(3) Route of entry. The path by which a chemical can enter the body. There are three main routes of entry: inhalation, ingestion, and skin absorption.

(4) Exposure. Any potential or actual exposure to a hazardous chemical during employment. Exposure can occur via any combination of inhalation, ingestion, and skin contact or absorption.

Other forms of exposure includes consumption of contaminated products such as drinking water or stored food etc.

(5) IDLH. Immediately Dangerous to Life or Health. Used to describe hazardous atmospheres where employee exposure can cause serious injury or death within a short time interval or serious delayed effects.

(6) Acute exposure. Exposure to high concentration of a chemical occurring suddenly over a short time interval.

Example, exposure to over 1000 ppm of hydrogen sulfide gas in less than one minute.

(7) Acute effect. Health effects resulting from acute exposure.

Example, becoming unconscious, or sudden convulsions.

(8) Chronic exposure. Exposure to a chemical or a product occurring slowly over a long period of time.

(9) Chronic effect. An adverse effect resulting from chronic exposure.

Exampe, irritated skin resulting from exposures to a solvent or paint thinner such as acetone.

Example, loss or diminished hearing in workers working in a noisy environment such as, concrete drillers, runway workers, and musicians etc.

(10) Acid. A chemical compound containing one or more hydrogen ions that will liberate hydrogen gas on contact with certain metals and very active chemically.

Acids may cause severe tissue burns.

(11) Base or Alkali. A chemical compound that contains the hydroxide ion, is the chemical opposite of an inorganic acid and in very active chemicals.

Bases are corrosive to the skin tissue.

(12) pH. A unit of measure to express the degree of acidity or alkalinity of a solution with neutrality indicated as 7.0.

(13) Alkalinity or causticity. The degree to which the pH of a substance is above 7.0.

(14) Corrosive. A substance that causes visible destruction or permanent changes in human skin at the site of contact.

Any substance having a pH of 4 or less and 9 or more is considered to be corrosive.

(15) Dermatitis. Inflammation of the skin.

(16) Irritant. A substance that produces an irritating effect when it contacts skin, eyes, nose, or respiratory system.

(17) Cancer. A cellular tumor the natural course of which is fatal and usually associated with formation of secondary tumors.

(18) Carcinoma. A malignant tumor.

(19) Carcinogen. A substance or agent capable of causing or producing cancer in mammals, including humans.

(20) Suspect carcinogen. A material which is believed to be capable of causing cancer but for which there is a limited scientific evidence.

(21) Teratogen. A chemical or a product that may cause physical defects in the developing embryo or fetus when a pregnant female is exposed to that product.

Example, pesticides such as DDT have been known to be very persistent in the atmosphere (do not disintegrate, retain their properties, etc.) and caused severe birth defects including infertility in several population groups (eagles, condor etc.).

(22) Reproductive toxin. Substances that affect either male or female reproductive systems and may impair the ability to have children.

(23) Sensitizer. A chemical that causes a substantial proportion of exposed people to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

Example, loss of ability to smell a paint thinner or a solvent because of the exposure resulting from prolonged use.

(24) Poison. Any substance or a product having potential to cause injury, illness, or death to a living tissue.

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e. Physical Hazards.

(1) Physical hazard. Any chemical that may cause property damage or traumatic injuries to exposed employees.

(2) Vapor. A vapor is a gaseous phase of a substance.

Example, gasoline vapors exist over liquid gasoline at room temperature.

(3) Volatility. The tendency or ability of a liquid to evaporate. Liquids having the potential to evaporate rapidly at normal temperatures (that is without any external source of heat) are called volatile.

Example, gasoline, alcohols, paint thinners and paint strippers etc.

Volatility is indicative of hazards such as flammability or explosivity or IDLH atmosphere.

Example, gasoline is very volatile and hence poses a fire and explosion hazard.

Example, excessive concentration of solvent vapors (paint thinners etc.) could cause death due to asyphixiation.

(4) Reactivity. Potential to undergo a chemical reaction or change resulting in an explosion or burning or in causing corrosive or toxic emissions, etc.

Example, muriatic acid solution gives off vapors that can cause severe burns.

(5) Explosion. A sudden, violent release of mechanical, chemical, or nuclear energy from a confined region. An explosion is propagated by a heat wave and travels at subsonic speeds.

(6) Combustible liquid. Any liquid that catches fire and burns without any external source of heat (sustains combustion).

(7) Flammable liquid. Any liquid that catches fire easily and does not require high temperatures to do so.

Example, gasoline catches fire easily.

(8) Flash point. The lowest temperature at which a liquid gives off enough vapors to form an ignitable mixture with air and produces a flame when a source of ignition is present.

(9) Fire point. The lowest temperature at which a material can evolve vapors to support continuous combustion.

(10) Flammable limits. Flammables have a minimum concentration in air below which propagation of flame does not occur on contact with a source of ignition. This is the lower flammable limit (LFL) or lower explosive limit (LEL). There is also a maximum concentration of vapor or gas in air above which propagation of flame does not occur. This is the upper flammable limit (UFL) or the upper explosive limit (UEL). These units are expressed in percent of gas or vapor in air by volume.

(11) Flammable range. The difference between the upper and lower flammable limits. Also referred to as the explosive range.

(12) Extinguishing media. The firefighting substance to be used to control a material in the event of a fire (i.e., fog, foam, water, etc.).

Water, though a well known fire extinguisher is not applicable to all the situations. Certain chemicals or products when ignited require specific substances to put-out the flames.

(13) Dry chemical. A powdered fire-extinguishing agent usually composed of sodium bicarbonate, potassium bicarbonate, etc.

f. Exposure Controls.

(1) Container. Any bag, barrel, box, can, cylinder, drum, reaction vessel, storage tank, etc., containing a hazardous chemical.

(2) Engineering Controls. Methods of controlling employee exposures by modifying the source or reducing the quantity of contaminants released into a work environment.

(3) Dike. A barrier constructed to contain or confine hazardous substances and to prevent them from entering sewers, ditches, streams, or other flowing waters.

(4) Exhaust System. A system for exhausting air from a general work area. Example, an exhaust fan.

(5) Ventilation. Exhaust system consisting of either natural or mechanically induced fresh air movements to mix with and dilute contaminants in the workroom air. This type of exhaust system is not recommended for controlling toxic contaminants.

(6) Local Exhaust Ventilation. A ventilation system that captures and removes the contaminants at the point they are being generated.

This type of exhaust system is intended for capturing vapors at the point of generation and is usually effective in controlling the hazardous and toxic vapors.

g. Warning Signs and Labels.

(1) Hazard warning. Any words, pictures, symbols that describe the hazards of a chemical or product.

(2) Label. Any written, printed, or graphic material attached to a chemical container or a product.

h. Chemical Concentration and Exposure Limit.

(1) Concentration. The amount of a given substance in a stated unit of measure. Common methods of stating concentration are percent by weight or volume, weight per unit volume, normality, etc.

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(2) PPM. Parts per million. The concentration of a gas or vapor in air, expressed as parts (by volume) of the gas or vapor in million parts of air. Also, the concentration of an ingredient in a liquid or solid.

(3) Ceiling limit value. The maximum allowable human exposure limit for an airborne substance, which is not to be exceeded even momentarily.

(4) Permissible Exposure Limit (PEL**)**. An exposure limit that is published and enforced by OSHA as a legal standard.

(5) STEL. Short-term exposure limit. ACGIH-recommended exposure limit. The maximum concentration to which workers can be exposed for a short period of time (15 minutes) four times throughout the day with at least one hour between exposures.

(6) TLV. Threshold limit value. ACGIH time-weighted average concentration under which most people can work consistently for 8 hours a day, day after day, without harmful effects.

(7) TWA. Time-weighted average concentration. Refers to concentrations of airborne toxic materials, which have been weighted for a certain time duration, usually 8 hours.

i. Solubility and Material Safety Data Sheet.

(1) Solubility in water. A term expressing the percentage of a material that will dissolve in water at ambient temperature.

Solubility information can be useful in determining spill cleanup methods and extinguishing agents, etc.

(2) Solvent. A substance that dissolves another substance. Usually refers to organic solvents.

Example, acetone can be used to remove paints.

(3) Specific gravity. The weight of a solid or liquid as compared to the weight of an equal volume of water.

Insoluble materials with a specific gravity greater than 1.0 will sink in water.

Most flammable liquids have a specific gravity of less than 1.0 and float on water.

(4) Personal Protective Equipment (PPE). Devices worn by the worker to protect against hazards in the environment, e.g., gloves, goggles, respirators, and protective clothing.

(5) Material Safety Data Sheet (MSDS). Written documentation of a chemical's identity and hazardous properties and the precautions for its safe use.

Appendix B

Material Safety Data Sheet (MSDS)

- All the employees shall be trained in reading and interpreting an MSDS.
- An MSDS is organized into eight (8) different sections or blocks.
- All the necessary information concerning a chemical or product has been included in these sections.
- The following illustration is intended for emphasizing the need for the ability to read and interpret an MSDS. For the purposes of the following illustration, a chemical solvent "acetone" is used as an example. Also, a copy of the MSDS for acetone is included as an attachment.
- Employees shall be able to relate the significance of the following aspects of an MSDS to a workplace chemical or an off-the-shelf product.

(1) Product Name or Trade Name. Example, Acetone.

Name of a chemical or product is the first and the foremost information listed on an MSDS.

(2) Manufacturer. Example, Austin James Co.
Emergency Contacts. Phone: (404) 625-1212

Name of the manufacturer, emergency contact info, and other details are listed in the block titled *"General Information."*

(3) Ingredients/Identity Info. Example, Acetone.

Ingredients of the chemical or a product including exposure limits and other details are listed in the block titled *"Ingredients/Identity Information."*

OSHA PEL	1000 ppm
ACGIH TLV	750 ppm
ACGIH STEL	1000 ppm

(4) Physical/Chemical Characteristics.

Boiling point, volatility and other details are listed in the block titled *"Physical/Chemical Characteristics."*

Boiling Point	134 ^{0}F (56.5 ^{0}C)
Melting Point	-139 ^{0}F (-95.0 ^{0}C)
Specific Gravity	0.8
Solubility in Water	Completely
Percent Volatiles By Volume	100.0

(5) Fire and Explosion Hazard Data.

Properties that are indicative of physical hazards such as flammability, and explosivity, etc. are listed in the block titled *"Fire and Explosion Hazard Data."*

Flash Point	0 ^{0}F (-18 ^{0}C)
Lower Explosive Limit	2.6
Upper Explosive Limit	12.8
Extinguishing Media	Water, Dry Chemical, etc.
Fire and Explosion Hazards	Above flash point, vapor-air mixtures are explosive within flammable limits.

(6) Reactivity Data.

Details concerning the conditions and materials to avoid and reactivity are listed in the block titled *"Reactivity Data."*

Stability	Yes
Conditions to avoid	Heat and ignition sources
Materials to avoid	Oxidizers, chloroform, etc.
Hazardous decomposition products	Carbon monoxide, etc.

(7) Health Hazard Data.

Potential exposure pathways, health hazards, and emergency procedures are listed in the block titled *"Health Hazard Data."*

Route of Entry Inhalation Yes
Route of Entry Skin Yes
Route of Entry Ingestion Yes
Health Hazards Acute and Chronic

Eyes: Severe irritation, redness, and pain.
Skin: Irritation, defatting, redness, pain, drying, and cracking.
Other: Irritation to nose throat, mucuous membranes, dizziness, dullness, headache and narcotic effects.
Ingestion: Narcotic effects and same effects as inhalation.
Chronic exposure: May produce severe irritation or dermatitis.
Carcogenicity NTP: NO
Carcogenicity IARC: NO
Carcogenicity OSHA: NO
Medical Conditions Aggravated By Exposure: Use of alcoholic beverages enhances toxic effects.
Emergency/First Aid Procedures: If exposure is through inhalation, remove the subject to fresh air and give CPT/Oxygen. If exposure is through ingestion, give water and induce vomiting. Nothing by mouth if unconscious. If exposure is through skin/eye remove the contaminated clothing, wash skin with soap, flush eyes with water for 20 minutes and get medical help immediately.

(8) Precautions for Safe Handling and Use.

Safe storage, handling, spill response, and disposal methods are listed in the block titled *"Precautions for Safe Handling and Use."*

Spill: Remove source of ignition. Dike large spill. Absorb small spill. Use protective clothing, and forced air ventilation.

(9) Control Measures.

The PPE and the controls necessary for preventing or minimizing exposures are listed in the block titled *"Control Measures."*

Respiratory Protection: Supplied Air/SCBA. Escape: Gas/Mask.
Ventilation: As required to maintain below TLV/PEL.
Protective Gloves: Impervious type.
Eye Protection: Safety glasses/Face shield.
Other Protective Equipment: Shower, eye wash station.
Work Practices: Wash thoroughly after handling.

The proponent of this publication is the AMEDDC&S & FSH Safety Office, directorate of Safety, Environment, and Fire. Users Are invited to send comments and suggested improvements on DA Form 2028, (Recommended Changes to Publications Blank Forms) To the Directorate of Safety, Environment, and Fire, ATTN: MCCS-BFE-S, 2202 15th Street, Ste 36, Fort Sam Houston, TX 78234.

FOR THE COMMANDER:

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